AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-47. (canceled)

48. (withdrawn) A CVD system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a CVD process, the system comprising:

a plurality of stations involved in performing one or more aspects of the CVD process;

a wafer transfer mechanism disposed within the system to transfer the wafer between stations;

means for illuminating the wafer while the wafer is transferred between stations;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

a processing means for analyzing said plurality of one-dimensional spectral frames, where said processing means aggregates sequential one-dimensional spectral frames to form two-dimensional spectral images and analyzes said two-dimensional spectral images to determine a one or more thickness values for one or more of the one or more film layers.

49. (withdrawn) The system of claim 48 where said processing means determines a process endpoint.

50. (withdrawn) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a CVD process, the method comprising the steps of:

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a sequence of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by a transfer mechanism used to move wafers between one or more storage and one or more process stations;

aggregating said sequence of one-dimensional spectral frames to form a two-dimensional spectral image, and analyzing said two-dimensional image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

51. (withdrawn) The method of claim 50 where analyzing determines a process endpoint.

52. (withdrawn) A CMP system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a CMP process, the system comprising:

a plurality of stations involved in performing one or more aspects of the CMP process;

a wafer transfer mechanism disposed within the system to transfer the wafer between said stations;

means for illuminating the wafer while the wafer is transferred between stations;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

means for processing said plurality of one-dimensional spectral frames, where said processing means aggregates sequential one-dimensional spectral frames to form a two-dimensional spectral image, and analyzes said two-dimensional spectral image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

53. (withdrawn) The system of claim 52 where said processing means determines a process endpoint.

54. (withdrawn) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a CMP process, the method comprising the steps of:

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a sequence of spatially contiguous one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by a transfer mechanism used to move wafers between one or more storage and one or more process stations;

aggregating said frames to form a two-dimensional spectral image; and

analyzing said two-dimensional spectral image to determine a one or more film layer thickness values of a one or more of the one or more films at one or more sites on the wafer.

55. (withdrawn) The method of claim 54 where analyzing said two-dimensional spectral image determines a process endpoint.

56. (withdrawn) A semiconductor wafer processing system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a process, the system comprising:

a plurality of stations involved in performing one or more aspects of the system process;

a wafer transfer mechanism disposed within the system to transfer the wafer between stations;

means for illuminating the wafer while the wafer is transferred between said stations;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer, and where said spectral imager is configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

a processing means for analyzing said plurality of one-dimensional spectral frames, where said processing means aggregates sequential one-dimensional spectral frames to form two-

dimensional spectral images, and analyzes said two-dimensional spectral image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

57. (withdrawn) The system of claim 56 where said processing means determines a process endpoint.

58. (withdrawn) The system of claim 56 where the process is one of: a CVD process, a CMP process, or a stand-alone metrology process.

59. (withdrawn) The system of claim 56 where stations include one of: a load station, an unload station, or a process station.

60. (withdrawn) The system of claim 56 where said illuminating means operates in either a pulsed mode or in a continuous mode while said spectral imager detects light.

61. (withdrawn) A method of acquiring and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a wafer manufacturing process, the method comprising the steps of:

securing the wafer in a transfer mechanism;

illuminating the wafer with light from a light source;

positioning the wafer using said transfer mechanism so that light from said light source illuminates a desired portion of the wafer;

detecting light from said light source that is reflected from said desired portion of the wafer using a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer, and where said spectral imager is configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

analyzing said plurality of one-dimensional spectral frames with a means for processing, where said processing means aggregates sequential one-dimensional spectral frames to form two-dimensional spectral images, and analyzes said two-dimensional image to determine a one or

more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

62. (withdrawn) The method of claim 61 where analyzing said two-dimensional spectral image determines a process endpoint.

63. (withdrawn) The method of claim 61 where said light source operates in either in a continuous mode, or in a pulsed mode while said spectral imager detects light.

64. (withdrawn) A semiconductor wafer processing system that provides and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a process, the system comprising:

a wafer transfer mechanism disposed within the system to transfer the wafer between a load station and a wafer chuck;

means for illuminating the wafer while the wafer is transferred between said load station and said wafer chuck;

a spectral imager disposed to detect light reflected from the wafer and configured to produce a one-dimensional spectral frame while said spectral imager and the wafer undergo relative motion; and

a processor that analyzes said one-dimensional frame to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

65. (withdrawn) The system of claim 64 where said processor determines a process endpoint.

66. (withdrawn) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a wafer manufacturing process, the method comprising the steps of:

securing the wafer in a transfer mechanism;

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated using said transfer mechanism;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a one-dimensional spectral frame; and

analyzing said one-dimensional spectral frame to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

67. (withdrawn) The method of claim 66 where analyzing said one-dimensional spectral image determines a process endpoint.

68. (withdrawn) A semiconductor wafer imaging system that acquires and analyzes spectral images of a wafer having one or more film layers prior to and/or following a process, the system comprising:

a first processing system that performs a first manufacturing step on the wafer;

a second processing system that performs a second manufacturing step on the wafer, where said second manufacturing step follows said first manufacturing step;

a wafer transfer mechanism disposed to transfer the wafer between said first processing system and said second processing system;

means for illuminating the wafer while the wafer is transferred between said first processing system and said second processing system;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer, and where said spectral imager is configured to produce one-dimensional spectral frames; and

means for aggregating said one-dimensional spectral frames to form a two-dimensional spectral image and analyzing said two-dimensional image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

69. (withdrawn) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers between two wafer manufacturing processes, the method comprising the steps of:

using a transfer mechanism to secure the wafer from a first processing system that performs a first manufacturing step on the wafer;

illuminating the wafer with light from a light source;

positioning the wafer using said transfer mechanism so that a desired portion of the wafer is illuminated by light from said light source;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a sequence of contiguous one-dimensional spectral frames while said transfer mechanism moves the wafer;

aggregating said sequence of contiguous one-dimensional spectral frames to form a two-dimensional spectral image;

analyzing said two-dimensional image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer; and

transferring the wafer to a second processing system that performs a second manufacturing step on the wafer.

70. (previously presented) A CVD system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a CVD process, the system comprising:

a viewport for providing optical access to said CVD system;

means for illuminating the wafer through said viewport;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and passes through said viewport, where said spectral imager is configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion; and

means for aggregating said sequence of contiguous one-dimensional spectral frames to form a two-dimensional spectral image, and to analyze said two-dimensional spectral image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

71. (previously presented) The system of claim 70 where said aggregating means determines a process endpoint.

72. (previously presented) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a CVD process, the method comprising the steps of:

illuminating the wafer through a viewport with light from a light source;

positioning the wafer so that a desired portion of the wafer is illuminated with light that has passed through said viewport;

detecting light from said light source that is reflected from said desired portion of the wafer and passes through said viewport using a spectral imager configured to produce a sequence of spatially contiguous one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion;

aggregating said frames to form a two-dimensional spectral image; and

analyzing said two-dimensional spectral images to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

73. (previously presented) The method of claim 72 where analyzing said two-dimensional spectral image determines a process endpoint.

74. (previously presented) A semiconductor wafer processing system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a process, the system comprising:

a viewport for providing optical access to said system;

means for illuminating the wafer through said viewport;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and passes through said viewport, where said spectral imager is configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion; and

means for aggregating said sequence of one-dimensional spectral frames to form a two-dimensional spectral image and to analyze said two-dimensional image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

75. (previously presented) The system of claim 74 where said aggregating means determines a process endpoint.

76. (previously presented) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a wafer manufacturing process, the method comprising the steps of:

illuminating the wafer through a viewport with light from a light source;

positioning the wafer so that a desired portion of the wafer is illuminated with light that has passed through said viewport;

detecting light from said light source that is reflected from said desired portion of the wafer and passes through said viewport using a spectral imager configured to produce a sequence of spatially contiguous one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion;

aggregating said frames to form a two-dimensional spectral image; and

analyzing said two-dimensional image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

77. (previously presented) The method of claim 76 where analyzing said two-dimensional spectral image determines a process endpoint.

78. (withdrawn) A system for obtaining and analyzing spectral images of a wafer having one or more film layers, the system comprising:

means for transferring the wafer;

means for illuminating the wafer; and

a spectral imager disposed to detect light reflected from the wafer, where said spectral imager includes a camera whose components are designed primarily and predominately for time

delay and integration and other non-spectrally-resolved line-scan applications and configured to operate in area scan mode to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion; and

means for aggregating said plurality of one-dimensional spectral frames to form a two-dimensional spectral image and for analyzing said two-dimensional spectral image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

79. (withdrawn) The system of claim 78 where said aggregating means determines a process endpoint.

80. (withdrawn) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers, the method comprising the steps of:

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated; and

detecting light reflected from said desired portion of the wafer using a spectral imager that includes a camera whose components were designed primarily and predominately for time delay and integration and other non-spectrally-resolved line-scan applications and configured to operate in area scan mode to produce a sequence of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion;

aggregating with a processor said frames to form two-dimensional spectral images of all or a portion of the wafer; and

analyzing said two-dimensional images to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

81. (withdrawn) The method of claim 80 where analyzing said two-dimensional spectral image determines a process endpoint.

82. (withdrawn) A spectral imaging system for generating and analyzing spectral images of a portion of a wafer having one or more film layers, the system including:

a first lens assembly for collecting light reflected from said portion of the wafer;

a slit that receives light focused by said first lens assembly and forms a one-dimensional line image from within said portion of the wafer, where said slit restricts the light collected by said first lens assembly to said one-dimensional line image;

a second lens assembly to direct said one-dimensional line image;

a diffractive element to receive light focused by said second lens assembly and to disperse light of said one-dimensional line image in a spectral direction perpendicular to said one-dimensional line image;

a camera whose components were designed primarily and predominately for time delay and integration and other non-spectrally-resolved line-scan applications and configured to operate in area scan mode to detect said dispersed light to form one-spatial dimension, one-spectral dimension frames of reflectance data; and

a processor for aggregating said frames to form two-dimensional spectral images of said portion of the wafer, and to analyze said two-dimensional spectral images to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

83. (withdrawn) The system of claim 82 where said processor determines a process endpoint.

84. (withdrawn) A method of generating and analyzing spectral images of a portion of a wafer having one or more film layers, the method including the steps of:

collecting light reflected from said portion of the wafer using a first lens assembly;

restricting the light collected by said first lens assembly using a slit that forms a one-dimensional line image from within said portion of the wafer, where said slit restricts the light collected by said first lens assembly to said one-dimensional line image;

directing said one-dimensional line image using a second lens assembly;

dispersing with a diffractive element said one-dimensional line image in a spectral direction perpendicular to said one-dimensional line image;

detecting said dispersed light with a camera whose components were designed primarily and predominately for time delay and integration and other non-spectrally-resolved line-scan

applications and configured to operate in area scan mode to form one-spatial dimension, one-spectral dimension frames of reflectance data; and

aggregating with a processor said frames to form two-dimensional spectral image of the portion of the wafer, and

analyzing said two-dimensional spectral image to determine a one or more thickness values for one or more of the one or more film layers at one or more sites on the wafer.

85. (withdrawn) The method of claim 84 where analyzing said two-dimensional spectral image determines a process endpoint.